The price of corporate liquidity: Acquisition discounts for unlisted targets

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Abstract: This paper documents acquisition discounts for stand-alone private firms and subsidiaries of other firms (unlisted targets) of 15 – 25%, on average, relative to acquisition multiples for comparable publicly-traded targets. My results support the contention that acquisition discounts for unlisted targets are the "price" paid by private owners or corporations for the liquidity provided by the buyer. Specifically, I demonstrate that corporate parents are significantly liquidity-constrained prior to the sale of a subsidiary, particularly so when the subsidiary is being sold for cash. Furthermore, acquisition discounts for stand-alone private targets are significantly greater (lower acquisition prices) when initial public offering volume is low, signifying lack of liquidity in the equity markets, and acquisition discounts for subsidiaries are significantly greater when debt capital is relatively more expensive to obtain. Acquisition discounts for subsidiaries are also significantly greater when the parent-firm has below-market stock returns in the 12 months prior to the sale. Overall, my results are strongly consistent with the notion that sale prices for unlisted targets are affected by both the need for, and availability of, liquidity.

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1. Introduction

Obtaining and maintaining liquidity can be expensive for corporations and their owners. Publicly-traded firms appear to hold larger-than-expected cash balances (Opler, Pinkowitz, Stulz, and Williamson, 1999), and the owners of privately-traded firms pay considerable costs to access the public pools of liquidity that allow them to diversify their portfolio (selling shares to the public). Whether because of information disparities between firms and public markets (Myers and Majluf, 1984), unexpected liquidity shortages (Opler, Pinkowitz, Stulz, and Williamson, 1999), or agency conflicts between stockholders and managers (Jensen and Meckling, 1976; Jensen, 1986), firms treat liquidity as a valuable resource. In this paper I investigate the cost of, and need for, accessing liquidity of a particular type – selling unlisted assets.

Faced with a need for greater liquidity, publicly-traded corporations and the owners of privately-held firms face a variety of choices for raising cash, all of which entail considerable cost.[1] Publicly-traded firms can sell additional shares into public (seasoned equity offerings) or private markets, borrow, or sell assets or subsidiaries. The owners of privately-held firms can sell shares to the public (an initial public offering), borrow, or sell assets (or the whole firm) to a willing buyer. The focus of this paper is the costs associated with the latter choices – selling a subsidiary or selling an entire privately-held firm.

Little is known about the cost (i.e. the price discount) of obtaining liquidity by selling a subsidiary or an entire unlisted firm. Conversely, considerable evidence exists concerning control premiums paid in acquisitions of publicly-traded firms (e.g. Schwert, 1996; and Officer, 2003), where the shareholders have a relatively reliable source of liquidity (the public market) to begin with. There is also considerable evidence on the cost to firms of obtaining liquidity through seasoned equity offerings (Smith, 1977; Smith, 1986; and Loderer, Sheehan, and Kadlec, 1991), sales of blocks of shares to private investors (private placements of public equity – Wruck, 1989), initial public offerings (Ritter, 1987), and on how the cost and availability of borrowing change with firms' financial conditions (Hickman, 1958; and Kaplan and Urwitz, 1979).

Evidence on the costs and benefits of obtaining liquidity by selling unlisted assets is important for at least two reasons. First, the sale of private firms and subsidiaries has become an increasingly important source of liquidity and restructuring for corporations over time (Table 4 in this paper; also see Bates, 2005), with almost two-thirds of acquisitions reported by the Securities Data Corporation (SDC) being of unlisted targets. This implies that the M&A market for unlisted

[1] For shareholders of publicly-traded firms, the liquidity problem is less severe because their shares can be traded with relative ease in public markets. The focus of this paper is the liquidity problem for owners of assets that are not publicly-traded, and therefore costly to collateralize or sell.

companies is at least as important as the M&A market for listed companies, and academics have little to say about prices or premiums/discounts in the M&A market for unlisted targets. Second, acquisitions of unlisted targets, particularly subsidiaries of other firms, provide an ideal experiment in which to test "fire sale" (Shleifer and Vishny, 1992) and liquidity discount theories, because the characteristics of the sellers (public firms) and the sale environment (alternate sources of liquidity) can be measured with some precision at the time of the sale.

This paper describes the level and determinants of premiums or multiples paid to acquire unlisted targets, and how these prices vary with the financial performance of the seller and the characteristics of debt and equity markets around the time of the sale. I find that unlisted targets sell at a discount of 15 – 25% on average relative to control-related trades of public firms, and almost 70% of unlisted targets in my sample are acquired at multiples less than that offered to acquire comparable publicly-traded firms. In other words, sellers of unlisted firms receive acquisition multiples that are considerably and significantly lower than the acquisition multiples received by sellers of publicly-traded firms. I also find that publicly-listed firms selling unlisted subsidiaries exhibit characteristics that are consistent with liquidity constraints. Specifically, relative to other firms of similar size in the same industry, selling firms have significantly lower cash balances, cash flow, net working capital, bond ratings, and Z-score (Altman, 1968), significantly higher leverage, and significantly negative 12-month abnormal returns leading up to the sale.

While the subsidiaries sold are small relative to the selling firms (4% of parent assets on average), the proceeds from the sale are large relative to parent's pre-sale cash balances (105% of existing cash balances on average). Thus, subsidiary sales appear to ease significant liquidity constraints at the selling firm. Using stock returns as an index for liquidity constraints, I find that parent firms get significantly lower sale multiples for their subsidiaries when their stock-returns in the year leading up to the sale are lower, particularly when divesting unrelated subsidiaries. In terms of economic significance, the discount from the average acquisition multiple for comparable publicly-traded firms is approximately 20% when the subsidiary is not in the parent's core industry and the parent firm has pre-sale annual abnormal return in excess of 5%, rising to approximately 40% for non-core subsidiaries when the parent's pre-sale annual abnormal return is more negative than –5%. In other words, parent firms sell unrelated subsidiaries at significantly greater discounts when their need for liquidity is the greatest.

The availability of alternate sources of liquidity also impacts the sale price – subsidiary sale multiples are significantly lower relative to comparable multiples for publicly-traded targets when corporate loan spreads (over the federal funds rate) are high, and private-firm sale multiples

are significantly lower relative to comparable multiples for publicly-traded targets when IPO volume is low – the cost of obtaining liquidity by selling a non-traded asset is significantly higher when it is more costly to obtain liquidity from an alternate source (borrowing or selling shares to the public).

Measuring acquisition *prices* for unlisted firms is relatively straightforward, as these prices are typically reported by either the seller (when a subsidiary is sold) or the buyer (when a privately-held firm is acquired), and recorded by SDC. It is, however, not so straightforward to find the appropriate metric against which to compare the sale price to infer the "premium" or "discount" relative to the fair value of the assets being sold. For acquisitions of publicly-held firms, the appropriate metric is obviously the pre-bid market value of the firm being sold, and the premium over the pre-bid market value can be interpreted as the value paid by the bidder for control of the target (and all the associated benefits that come with control, such as exploiting any synergies). Unlisted targets, by definition, do not have publicly-traded shares that can be used to assess the pre-bid "fair" or market value of the entity being sold.

I overcome this obstacle by using two related techniques to compute acquisition premiums or discounts for unlisted targets. Both use reported acquisition multiples from the SDC Mergers and Acquisitions database, and compare these multiples to either a) similar metrics using accounting data for comparable publicly-traded firms (the traditional "comparables" technique), or b) the same acquisition multiples for comparable publicly-traded targets. In both cases, "comparable" refers to matching by both industry and size (as described in Section 3). Using the former, the numerical results can be interpreted as acquisition premiums, while the latter provides evidence on the discounts in acquisitions of unlisted targets relative to acquisitions of listed targets.

In this paper, I argue that while the traditional comparables method (a, above) has been used and discussed extensively in the literature (for example, Boatsman and Baskin, 1981; Alford, 1992; Berger and Ofek, 1995; Kaplan and Ruback, 1995; Kim and Ritter, 1999; and Gilson, Hotchkiss, and Ruback, 2000), weaknesses in the simple comparables technique (Kaplan and Ruback, 1995; and Kim and Ritter, 1999) suggest that comparing unlisted targets to comparable *acquisitions* (as opposed to comparable publicly-traded, but non-targeted, firms) provides more powerful evidence on the liquidity discount in acquisitions of unlisted targets. The approach favored here (comparing acquisition multiples for unlisted targets to acquisition multiples for publicly-traded targets; b, above) is essentially the same as the "comparable industry

transaction method" in Kaplan and Ruback (1995),[2] and those authors found that this technique provides lower average valuation errors in their setting (highly-leveraged transactions) than the traditional comparables approach.

The percent difference in acquisition multiples between listed and unlisted targets (hereafter, acquisition discounts) is the discount to the fair control value of the assets being sold, and will be interpreted here as the cost of obtaining liquidity via the sale of a whole unlisted firm or an unlisted subsidiary. Only 12% of the full sample of unlisted acquisitions has enough data to compute the acquisition discount noted above. However, I also show that while the portion of the sample with data is slightly skewed towards larger, completed deals (relative to the portion of the sample lacking data), the data appears to be representative enough to provide robust and generalizable results.

The remainder of this paper is organized as follows. Section 2 explains how this research is connected to the existing literature, and describes the principal hypotheses. Section 3 provides a description of the data sources and outlines the estimates of premiums and acquisition discounts in greater detail. Section 4 provides univariate and multivariate analyses of acquisition discounts, explaining why these discounts vary in the cross-section and time-series. Section 5 summarizes the findings, and offers conclusions and implications for contemporaneous and future research.

2. Related literature and hypotheses

2.1. Related literature

This paper is related to several different strands of the literature. A number of recent papers have examined the decision to sell subsidiaries (or major assets). Bates (2005) studies the use of cash generated by subsidiary sales, and how firms' investment opportunities and capital structures affect the use to which subsidiary sale proceeds are put and the market reaction to such decisions. Schlingemann, Stulz, Walkling (2002) (SSW) demonstrates that firms are more likely to divest subsidiaries that are in industries in which there has been a lot of merger and acquisition activity in the recent past, consistent with the notion that firms are likely to sell corporate assets with the most liquid markets. Lang, Poulsen, and Stulz (1995) (LPS) argue (as do I) that firms sell assets to obtain liquidity, and find that firms tend to divest subsidiaries or sell major assets following poor (absolute, not industry-adjusted) performance, and that the market reaction to the sale depends on the intended use of the funds raised. Kim (1998) finds that firms in the contract drilling industry only sell illiquid assets when the costs associated with alternate sources of liquidity are prohibitively high, and, similar to SSW, that firms sell the most liquid assets (oil

[2] p. 1067 of that paper.

wells) before choosing to sell the least liquid assets. Brown, James, and Mooradian (1994) examine the stock returns to announcements of asset sales by distressed firms and find significantly lower returns when the proceeds from an asset sale are used to pay down the firm's debt.

While all these papers study some aspect of the divestiture decision, none examine the pricing of subsidiary sales, or how the cost or availability of alternate sources of liquidity affects the price that the owner of an unlisted asset is prepared to accept when faced with the need for liquidity. This paper differs from Bates (2005) and SSW (2002) primarily because of my focus on the pricing of subsidiary sales taking the sale as given, as opposed to focusing on the sale decision (SSW, 2002) or the use of funds produced by the sale (Bates, 2005). My study is most similar to LPS (1995) in spirit, but differs from LPS in a number of important respects. While LPS report the "accounting gain/loss" on subsidiary sales, they do not examine the market pricing of subsidiary sales or provide evidence on how subsidiary sale pricing varies with the cost of alternate sources of financing. While LPS show that parents divesting subsidiaries perform poorly prior to the sale,[3] their performance characteristics are not industry adjusted and they do not consider cash balances and cash flow specifically – in this paper I demonstrate that firms selling substantial assets are liquidity constrained (low cash balance and cash flow) and performing poorly relative to industry- and size-matched peers.

There is also a considerable literature on asset "fire sales." Shleifer and Vishny (1992) describe a model in which sellers of assets are forced to accept discounted prices because negative economic shocks forcing parent-firms into fire sales of assets are likely to be correlated across firms in an industry, implying that likely buyers (firms in the same industry as the seller) are also liquidity constrained at the time that sellers want to divest subsidiaries. Shleifer and Vishny use this observation to predict asset fire sales, implying depressed sale prices when financially constrained firms sell assets and a greater likelihood that the assets will be sold to buyers outside the industry (who are not impaired by the common shock). Evidence consistent with the Shleifer and Vishny (1992) model is reported in Pulvino (1998) (used aircraft), Brown (2000) (real estate investment trusts), and Kruse (2002) (general corporate assets).

With the exception of Pulvino (1998), however, none of these studies examine the issue of pricing in distressed-firm "fire sales" of assets – Pulvino shows that financially constrained airlines receive lower prices than unconstrained airlines when selling used aircraft, and that financially constrained airlines are more likely to sell to firms outside the aviation industry during market downturns. This study is reasonably similar to Pulvino's, except that my sample is more

[3] p.12 and Table 2 in Lang, Poulsen, and Stulz (1995).

general and I demonstrate that pricing in both subsidiary sales and sales of private firms is affected by the cost or availability of alternate sources of liquidity for the owners of assets that are not publicly-traded.

While the academic literature has had little to say on the issue of pricing in direct sales of subsidiaries or private firms, practitioners appear to have considerable interest in this area, and believe that unlisted firms or subsidiaries sell at a discount on average compared to publicly-traded targets. For example, the investment bank Houlihan Lokey Howard and Zukin report (in the *Mergerstat Review*) lower acquisition multiples (P/E) for acquisitions of private companies (not subsidiaries) relative to public companies in every year prior to 1993. Commenting on this data, Pratt, Reilly, and Schweihs (2000) note that "… the data are clear that privately owned companies realize lower acquisition P/E multiples, on the average, when compared to publicly traded companies."[4] Even though academics have paid little attention to acquisitions *prices* in deals to acquire unlisted targets, there has been considerable academic interest in recent years in the effect of unlisted acquisitions on *bidder* returns. Indeed, Fuller, Netter, and Stegemoller (2002) show that bidders earn superior returns around the announcement of acquisitions of unlisted targets relative to listed targets, and posit (but do not demonstrate) that this return difference may be attributable to lower acquisition prices or premiums in acquisitions of unlisted targets.[5]

2.2. Hypotheses

The owner(s) of an unlisted firm cannot trade their equity easily: for private stand-alone firms the obvious alternative to selling to another company is to go through an IPO (Poulsen and Stegemoller, 2005), and for parent-firms the alternative to selling to another company is to spin-off the entirety (or carve-out a piece of) the subsidiary into public markets. All of these alternatives entail substantial transaction costs (out-of-pocket costs of offering securities to the public, and any underpricing of the securities sold), and the sale process for unlisted firms can be opaque (Fuller, Netter, and Stegemoller, 2002) and involve significantly fewer competing bids than observed in sales of publicly-traded targets (Table 1, below).

This suggests that unlisted firms will sell at a discount to comparable listed firms in the mergers and acquisitions market because of the value of the provision of liquidity to the seller. More often than not, especially for sales of subsidiaries by parent firms, payment is made in the

[4] Pratt, Reilly, and Schweihs (2000), chapter 17.

[5] These return differences have been shown (for example, in Faccio, McConnell, and Stolin, 2004) to be robust to controlling for such correlated variables as the method of payment, the form of the acquisition, the size of the bidder, and so on.

form of cash (Table 1, below, but also see Fuller, Netter, and Stegemoller, 2002), which further suggests that acquisitions of unlisted targets are motivated by the sellers' desire for liquidity and that the value of such liquidity should be reflected in the price paid by the buyer. This intuition is formalized in the hypothesis below:

H1: *Unlisted targets sell at discount to (or at a lower premium over "fair value" than) comparable listed targets* ***on average.***

Furthermore, the bargaining position of the owners of an unlisted firm should be affected by their need for liquidity and the availability of alternate sources of liquidity. In other words, if the sale prices of unlisted targets reflect a discount for the liquidity provided by the buyer (H1), then the provision of liquidity should be relatively more valuable both when the seller's need for liquidity is the greatest and when capital market conditions make obtaining liquidity from other sources more difficult. In both cases, the seller's ability to bargain over the sale price is weakened by their need for a sale (Shleifer and Vishny's (1992) "fire sales") and/or their inability to pursue alternate (costly) methods of exchanging non-traded shares for either cash or securities that are easier to cash out of. This leads to the following two related hypotheses:

H2a: *Unlisted targets sell at a* ***greater*** *discount to comparable listed targets when the seller's pre-sale financial condition is worse ("fire sales").*

H2b: *Unlisted targets sell at a* ***greater*** *discount to comparable listed targets when debt- and equity-market conditions make alternate sources of liquidity more difficult or costly to obtain.*

H1 concerns the average discount in acquisitions of unlisted targets, but while H1 may be empirically verified in the data, the existence of discounts in the sale of unlisted firms relative to listed firms does not, in itself, have to be because of the value of liquidity provided to the seller(s) by the bidder. While "liquidity discounts" is the natural interpretation of average acquisition discounts for unlisted targets, there are various alternatives that have been suggested in the literature. In particular, bidders in acquisitions of unlisted targets are substantially smaller than bidders acquiring publicly-traded firms. If large firms are more likely to experience agency problems leading to empire building and hubris in takeover bidding (Jensen, 1986; and Roll, 1986), it is possible that acquisition discounts for unlisted targets reflect "better" bidding activity

by smaller firms (Moeller, Schlingemann, and Stulz, 2004) rather than a liquidity discount. Another potential explanation for acquisition discounts is the possibility that unlisted firms are riskier acquisitions than listed firms because of either the nature of unlisted firms' businesses (high growth, uncertain prospects, and so on) or the information environment for unlisted firms (less publicly-available information for potential bidders to assess the firm's prospects - Pratt, Reilly, and Schweihs, 2000, chapter 17).

While this paper does not offer direct tests of these alternatives, there are several reasons to expect that acquisition discounts are driven by liquidity rather than bidding firms' agency problems or the nature of the business activities of unlisted firms. Specifically, although not tabulated here, there is no significant relation between acquisition discounts and bidder size in acquisitions of unlisted firms, despite the fact that bidder size varies considerably in this sample. Furthermore, I compute acquisition discounts by matching acquisitions of unlisted targets to acquisitions of publicly-traded firms by industry and size of the target. While the data does not offer any other robust matching variables, matching by industry and size ensures that at least two sources of risk or uncertainty (industry beta and size) that may make unlisted targets different from listed targets are controlled for here. In addition, it is difficult to believe that differences in the information environment between listed and unlisted targets explains acquisition discounts for unlisted targets, because I find substantial discounts for subsidiaries of publicly-traded firms – for many of these subsidiaries, there will be as much publicly-available information (via the parent) as there is for many publicly-traded targets.

Furthermore, this paper not only documents the *average* acquisition discount, but also demonstrates how these discounts vary with the *need for liquidity* (H2a) and the *availability of liquidity* (H2b). By doing so, the link between liquidity and acquisition discounts is clearer. While acquisition discounts may reflect factors other than the owner(s) need for liquidity, the significant relation between acquisition discounts and the need for or availability of liquidity (as hypothesized in H2a and H2b) will imply that acquisition discounts at least partly reflect the price of obtaining liquidity by selling an unlisted asset. In the words of Shleifer and Vishny (1992), "illiquidity makes assets cheap."[6]

3. Data and empirical methods

3.1. The sample

My sample of acquisition attempts for both publicly-traded and unlisted targets (stand-alone private corporations and subsidiaries of other corporations) comes from the SDC Mergers and

[6] Shleifer and Vishny (1992), p.1343.

Acquisitions database from 1979 to 2003. This sample includes successful and unsuccessful bids for at least 50% of the target's equity, conditional on a deal value of at least $50m, and only includes bids that are all-cash, all-common-stock, or a mix of cash and common stock.[7] The initial sample contains 12,716 bids, but the empirical tests offered below have greatly reduced sample sizes because acquisition multiple data from SDC is missing or inaccurate, and this acquisition multiple data is critical to inferring the acquisition discount for unlisted targets relative to comparable publicly-traded firms.

Table 1 documents the salient features of this sample. Both stand-alone and subsidiary unlisted targets have significantly lower total assets at the median in the year before the acquisition than publicly-traded targets, although the difference is greatly exacerbated for stand-alone private firms (median of $53m of total assets) versus publicly-traded targets (median of $293 million of total assets). Parent firms selling subsidiaries are identified on SDC's Mergers and Acquisitions database, and have median pre-bid market value of equity of $2.2b, although the much-higher mean is evidence of substantial outliers in the distribution. Unfortunately, the SDC Mergers and Acquisitions database does not report the total assets of the parent firm, and so parent-firm total asset data is found by matching parent-firms to Compustat. With median total assets of 5.5b, parents selling subsidiaries appear to be highly leveraged – the median *book* value of total assets for parent firms in my sample is more than twice the median *market* value of equity. At the median, parents are selling subsidiaries accounting for just 4% of the parent's total assets, although the average of 13% indicates that the sample contains some large subsidiary sales.[8]

While the subsidiaries being sold in this sample are only a small fraction of parent-firm total assets at the median, the infusion of liquidity provided by the subsidiary sale is substantial. Table 1 documents the ratio of the cash from a subsidiary sale as a percentage of the parent-firm's pre-sale cash balance, measured from Compustat one year prior to the acquisition bid for the subsidiary. This ratio has an extremely dispersed distribution, with the raw data affected by parent firms with negative or extremely small positive cash balances. The summary statistics for the ratio of cash infusion to cash balance in Table 1 are for a truncated distribution where ratios

[7] Bids with debt or preferred securities as compensation types are omitted.

[8] The Subsidiary percent of parent assets (%) variable has relatively few observations (220) for two reasons. The first is that SDC does not report total asset data for parent firms, and therefore parent firm accounting data (including the book value of assets) is taken from Compustat. The matching process from SDC to Compustat creates noise and reduces the number of usable observations. The second is that SDC's coverage of accounting data for subsidiary target is relatively thin, further reducing the sample size. This issue is addressed further below, as it also affects the number of usable premium and acquisition discount observations for subsidiary targets.

smaller than zero or larger than 500% are discarded. In this truncated distribution, the average parent firm in the sample receives cash from the subsidiary sale equal to 105% of their pre-sale cash balance (49% at the median). This suggests that the subsidiary sales in this sample are providing considerable infusions of liquidity for the parent firms.[9]

The average cumulative abnormal return over the bid announcement window for the parents is 1.9%, which is statistically significantly different from zero (test statistic not tabulated). This indicates that, at least on average, the market reacts favorably to the divestiture of subsidiaries in this sample. In results discussed in later sections of this paper, I find that parent firms selling subsidiaries are significantly liquidity-constrained relative to their peers prior to the sale, and the average positive market reaction to the sale announcement may reflect the fact that subsidiary sales provide such large liquidity infusions on average for parent firms. Compared to acquisitions of publicly-traded targets, acquisitions of unlisted targets are significantly more likely to be completed successfully (77% of offers for publicly-traded targets are successful versus 95% of offers reported by SDC for unlisted stand-alone targets), and correspondingly significantly less likely to involve competing bids for the targets (post-bid competition). Furthermore, offers for unlisted targets are significantly more likely to be all-cash offers (as opposed to mixed method-of-payment or all-stock) than those for publicly-traded targets are.

Table 2 contains summary statistics for the acquisition multiple data that is the focus of the analysis in this paper. Four different acquisition multiples reported by SDC are analyzed here – price to book value of equity, price to earnings, deal value to EBITDA, and deal value to sales.[10] Each acquisition multiple is the ratio of a measure of the value offered by the bidder for the target (price per target share or deal value excluding assumed liabilities) divided by a measure from the target's accounting statements for the year prior to the acquisition attempt (book value of equity per share, earnings per share, total earnings before interest, taxes, and depreciation, or sales).

The raw acquisition multiples described in Table 2 are not particularly interesting in their own right, as differences in acquisition multiples across categories of acquisitions (publicly-traded targets or unlisted targets) could simply reflect differences in the type of target in the different categories. For example, while the median price to book value of equity ratio in

[9] While it would be desirable to report statistics on how important the provision of liquidity is to the owner(s) of stand-alone unlisted firms sold in this sample, data on the wealth or portfolios of owners of stand-alone unlisted firms are extremely difficult to obtain.

[10] SDC reports several additional valuation multiples, for example deal value to pre tax income. For brevity, and because the additional variables do not add much texture to the analysis, I omit these variables from this paper. Including these variables results in substantially the same qualitative results as those reported in the remainder of this paper.

acquisitions of unlisted stand-alone companies (5.98) is significantly higher than the median of the same metric in acquisitions of publicly-traded targets (2.36), this difference could reflect the fact that unlisted targets are young, high growth companies which would command higher market-to-book ratios if they were publicly traded.

However, the raw acquisition multiples are presented in Table 2 for two reasons. Firstly, they demonstrate the attrition in the original sample due to lack of data from SDC. For example, while SDC reports 2,829 acquisition attempts for stand-alone private firms in the original sample (Table 1), SDC reports acquisition multiple data for only 10 – 20% of these observations (ranging from 205 in the deal value to EBITDA category to 619 in the deal value to sales category). The fraction of transactions with acquisition multiple data is similar for subsidiary targets. Secondly, the raw acquisition multiple data demonstrates how noisy this data is, with extreme outliers in both tails of the distribution. For example, the average of the price to book value of equity multiple reported by SDC for acquisitions in the stand-alone unlisted target category is 774.54, with a maximum of 167,250 and a minimum of 0.23.[11] While the medians are more reasonable as measures of an inherent market-to-book plus a premium, as the medians are not as affected by the outliers, the raw acquisition multiple data in all categories is clearly problematic. In the next section I describe how I deal with this issue, and demonstrate how the fraction of the sample with "reasonable" data is fairly representative of the full sample reported by SDC.

3.2. Measuring premiums and acquisition discounts

It is obviously impractical to measure acquisition premiums using market return or price data in this sample, as neither of these measures are commonly available for unlisted targets. I resolve this issue by using two methods to compute acquisition premiums.[12] The first uses acquisition multiples to infer *acquisition premiums*, and is a version of the traditional "comparables" technique found in the literature (Boatsman and Baskin, 1981; Alford, 1992; Berger and Ofek, 1995; Kaplan and Ruback, 1995; Kim and Ritter, 1999; and Gilson, Hotchkiss, and Ruback, 2000). Consider the following definition of an acquisition premium:

$$\text{Premium}_i = \frac{P_i^* - P_{i,t-k}}{P_{i,t-k}},$$

[11] Neither the minimum nor the maximum are tabulated.

[12] Each of these methods is distinct from the analysis in Ang and Kohers (2001), which reports "premiums" as simply the multiple offered by the bidder to the target.

where i refers to targets, P_i^* is the price offered by the bidder, and $P_{i,t-k}$ is the target's pre-bid market value per share. Dividing both numerator and denominator by some accounting measure, for example the book value of equity per share (BVE_i), yields:

$$\text{Premium}_i = \frac{\frac{P_i^*}{BVE_i} - \frac{P_{i,t-k}}{BVE_i}}{\frac{P_{i,t-k}}{BVE_i}}.$$

The first term in the numerator is given by SDC, the acquisition multiple expressed as a ratio of price paid to some accounting measure (in this example, book value of equity). The principal assumption required to translate the acquisition multiple into a premium measure is that the second term in the numerator (which is also the term in the denominator – the inherent market-to-book ratio for the target) can be proxied by the average market-to-book value of equity ratio for all publicly-traded firms in the same industry and of similar size as the target. Then, the following equation holds:

$$\text{Premium}_i = \frac{\frac{P_i^*}{BVE_i} - \overline{\overline{\frac{P_{i,t-k}}{BVE_i}}}}{\overline{\overline{\frac{P_{i,t-k}}{BVE_i}}}}, \qquad (1)$$

where $\overline{\overline{\frac{P_{i,t-k}}{BVE_i}}}$ indicates the average market valuation ratio for all comparable firms.[13]

The set of comparable firms for all publicly-traded and unlisted targets is a portfolio of industry- and size-matched firms from Compustat. Specifically, the portfolio of comparables for each target is all firms on Compustat in the same 2-digit SIC code as the target and with book value of assets from Compustat within 20% of target assets reported by SDC. The use of industry- and size-matched comparable portfolios is designed to control for as many potential risk factors that influence valuation as I am comfortable with given the data availability. By controlling for industry (asset beta) and size I am controlling for at least two important determinants of risk and, therefore, should obtain portfolios of comparable firms whose valuation

[13] The results reported here are not qualitatively affected if the median market-valuation multiple is used in place of the average.

multiples are reasonable proxies for the fair market valuation multiples for the targets in my sample.[14]

Clearly, I am also making the implicit assumption that, if they were publicly-traded, the equity in the unlisted targets in my sample would be priced at the average valuation multiple in the portfolio of industry- and size-matched comparable firms, implying that the difference between the acquisition multiple and the average comparable multiple is the premium for control in the acquisition attempt. While this is a critical assumption, it is consistent with prior work in the academic literature (for example, Berger and Ofek, 1995; Kaplan and Ruback, 1995; Kim and Ritter, 1999; and Gilson, Hotchkiss, and Ruback, 2000), and general valuation practice in finance (for example, Pratt, Reilly, and Schweihs, 2000, p.223).

Given that I use four acquisition multiples (Table 2), I use the four associated average market valuation multiples for comparable firms. These valuation multiples are the market-to-book equity ratio (used in the example above), the price to earnings ratio, the market value to EBITDA ratio, and the market value to sales ratio.[15] All data used to compute these valuation ratios is from Compustat from the year prior to the announcement of the acquisition attempt and equation (1) above is then used to compute the acquisition premium for all acquisitions.

Given the noise in the acquisition multiple data from SDC, it is not surprising that the resulting premium measures have outliers in both tails. To avoid the issue of absurd premium measures, I only include premiums in the analysis if the premium metric in question provides an estimate that is greater than -0.5 and less than 1. While these bounds are arbitrary, they are sensible (premiums are constrained to be no more than 100% and no less than -50%), and, most importantly, do not qualitatively affect the analysis. While some kind of truncation is necessary to obtain sensible premium estimates, the results in this paper are not greatly affected by widening or narrowing these bounds.

Means and medians for these premium measures are tabulated in Table 3. The numbers in square brackets are the number of observations in each cell, and comparing these to the corresponding number of observations in each cell in Table 2 demonstrates how much of the

[14] SDC does purport to report data items for targets in addition to industry and size: for example, leverage and earnings growth. While these factors would undoubtedly be useful control variables to get as precise portfolios of comparable firms as possible, these items are very sparsely populated for unlisted targets.

[15] For each of the comparable firms, the market price per share of common equity is the end of fiscal year closing price (annual data item #199), the number of shares outstanding and total book value of common equity are given as of the end of the fiscal year (annual data item #25 and #60, respectively), earnings-per-share is diluted and excluding extraordinary items (annual data item #57), EBITDA is assumed to be the Compustat field labeled "operating income before depreciation" (annual data item #13), and sales is annual data item #12.

sample is lost due to extreme values of the acquisition multiples from SDC.[16] For example, while SDC reports 4,046 price to book value of equity acquisition multiples for publicly-traded targets in this sample, the number of premiums in the truncated distribution for the price to book value of equity multiple is only 2,694, implying that one-third of the distribution of premium estimates is deemed unusable because the resulting premiums lie outside the {-0.5, 1} bounds. The attrition due to premium outliers is more severe in the unlisted categories (both stand-alone and subsidiary targets), where generally more than half the available sample from Table 2 is lost because of the premium truncation.

Three of the four primary premium estimates (price to book value of equity, deal value to EBITDA, and deal value to sales) show that control premiums are significantly lower at the median in acquisitions of subsidiaries than in acquisitions of publicly-traded targets. For example, using the excess of the price to book value of equity acquisition multiple over the average multiple for comparable firms on Compustat, publicly-traded targets are acquired at a premium of 16% on average (13% at the median) while unlisted subsidiaries of other firms are acquired at significantly lower premiums of 4% on average (*discounts* of 3% at the median). The same, however, is not true for the difference between control premiums in acquisitions of publicly-traded and unlisted stand-alone targets. In those categories, one metric (price to book value of equity) shows *higher* average premiums for unlisted targets than publicly-traded targets, and only the deal value to EBITDA measure results in significantly lower premiums for unlisted stand-alone targets relative to publicly-traded targets (11% versus 19% on average, respectively).

As the results differ substantially for the four different premium measures, the last row in Table 3 presents statistics for the average multiple-based premium, which is an equal-weighted average for each target of the primary multiple-based premiums in Table 3. The last row in Table 3 confirms that, using the average of all four premium metrics, owners of unlisted subsidiary targets receive significantly lower control premium offers from bidders on average than owners of publicly-traded targets do (8% versus 15%, respectively), but that there is no significant difference in average or median premiums between publicly-traded targets and unlisted stand-alone targets.

There are several weaknesses in the "direct" measures of premiums in Table 3, especially for unlisted target firms (the focus of this paper). Most of these weaknesses stem from the matching of data between SDC and Compustat. SIC codes are often assigned differently between financial databases (Kahle and Walkling, 1996), and the composition of the comparable-firm

[16] Very few observations are sacrificed in the truncation described above due to lack of a match to comparable firms with enough data to compute valid market valuation multiples from Compustat.

portfolios may be affected by differences in the way SDC and Compustat assign SIC codes. Furthermore, the comparable-firm portfolios are not only industry-matched but also jointly size-matched using total asset data from SDC for the unlisted targets to match to total asset data for comparable firms from Compustat. This also has the potential to generate noise in the matching process and contaminate the resulting premium estimates. Finally, unlisted targets are inherently different from Compustat comparables because unlisted targets are being acquired while very few of the Compustat comparable firms are subject to an acquisition bid. While the implicit assumption is that there are no value differences between acquired firms and those not being targeted for acquisitions (apart from the control premium), this may simply not be the case. In fact, Kaplan and Ruback (1995) find that forming comparable portfolios using firms in the same industry undergoing the *same transaction* (called the "comparable industry transaction method" in that paper) results in substantially more precise valuation estimates, and that the comparable industry transaction technique performs almost as well as valuation methods using forecasted cash flows (APV).

Therefore, the second method of assessing the difference between acquisitions of publicly-traded firms and unlisted firms involves matching unlisted targets to publicly-traded targets from the same SDC Mergers and Acquisitions database. This avoids the cross-database contamination issue, and also eases the concern about the comparability of firms subject to an acquisition attempt with those that are not subject to an acquisition attempt (as in Kaplan and Ruback, 1995). This "comparable transaction" approach is also commonly used by practitioners (for example, Pratt, Reilly, and Schweihs, 2000, p.259). One drawback to this comparable transaction approach relative to the traditional comparable-firm approach, however, is that the stock of comparable publicly-traded firms is large relative to the flow of comparable acquisitions. This issue is addressed below by expanding the window in which I match acquisitions of unlisted targets to comparable acquisitions of publicly-traded targets (to more than the one year used to match to comparable public firms).

The comparable industry transaction technique is implemented in the following way. For each unlisted target from SDC I form portfolios of comparable acquisitions of publicly-traded targets from the SDC data, where comparable acquisitions are those for which the publicly-traded target is in the same 2-digit SIC code as the unlisted target, has deal value excluding assumed liabilities within 20% of the deal value excluding assumed liabilities for the unlisted target (deal value measures are from SDC), and is announced within the three calendar-year window prior to the announcement of the unlisted acquisition.

I then compute the *acquisition discount* as the percent difference between the acquisition multiple (price to book value of equity, price to earnings, deal value to EBITDA, or deal value to sales) for the unlisted target and the average corresponding multiple for the portfolio of comparable publicly-listed targets. The acquisition discount is therefore a negative number if the acquisition multiple for the unlisted target is less than the average multiple in acquisitions of comparable publicly-traded targets, and positive if the acquisition multiple for the unlisted target is more than the average multiple in acquisitions of comparable publicly-traded targets. While the percent difference in multiples is *not* equal to the percent difference in premiums between unlisted and listed targets, under a relatively benign assumption it is a conservative measure of the percent difference in premiums between the two acquisition categories.[17]

Table 4 shows descriptive statistics for the acquisition discount computed separately for each multiple reported by SDC (price to book value of equity, price to earnings, deal value to EBITDA, and deal value to sales) and for the per-target average of these acquisition discounts. As with the premium estimates in Table 3, noise in the acquisition multiples data from SDC produces extreme outliers in the right-hand tail, and I discard observations for which the percent difference in multiples between that reported for the unlisted target and the average for the portfolio of comparable acquisitions is more positive than +1. While again this bound is arbitrary, it seems sensible to discard observations that suggest more than a 100% difference between the multiples in acquisitions of unlisted and listed targets.[18]

Almost every multiple displayed in Table 4 produces significantly negative estimates of the average and median acquisition discount for both stand-alone private firms and subsidiaries. The sole exception is the estimates of the acquisition discount for stand-alone private firms using the acquisition price to book value of equity multiple – in that case, the percent difference in acquisition multiples between stand-alone unlisted targets and portfolios of comparable acquisitions of publicly-traded firms has a significantly positive mean and median. That exception aside, the bulk of the evidence in Table 4 suggests that both stand-alone private targets

[17] Some fairly simple algebra (omitted for brevity) demonstrates that as long as premiums in acquisitions of *publicly-traded* targets are positive then the percent difference in acquisition *multiples* between listed and unlisted targets will be of the same sign as the percent difference in *premiums* between listed and unlisted targets, but of smaller magnitude. In other words, the percent difference in multiples understates the "true" difference in premiums between unlisted targets and comparable acquisitions of publicly-traded targets while reducing the noise associated with merging SDC data to Compustat.

[18] The upper bound can be increased to +2 without qualitatively affecting most of the results, but the upper bound of +1 is symmetric with the implicit lower bound of -1, and, given the conservative nature of the percent difference in multiples estimates (fn. 17), the upper bound of +1 allows for significantly more than 100% difference in premiums.

and targets that are subsidiaries of other firms are acquired at significantly lower multiples on average (and at the median) than comparable publicly-traded firms are.

The last row in Table 4 contains descriptive statistics for the equally-weighted average for each unlisted target of the acquisition discount estimates, and it is this equally-weighted average of the estimates produced by the individual multiples that I will refer to as the *acquisition discount* in the remainder of this paper. The acquisition discount averages -16% for stand-alone private firms (-21% at the median, 64% of the estimates are negative) and -26% for subsidiary targets (-34% at the median, 71% of the estimates are negative). In other words, unlisted targets are acquired at approximately a 15 – 25% discount relative to comparable publicly-traded targets on average, suggesting that obtaining liquidity by selling out to another firm carries a substantial price and consistent with H1 above.

3.3. Robustness and generalizability

One potential concern with the statistics in Table 4 is that the sample is so dramatically reduced by the limited availability of multiples data from SDC and the obvious errors in the multiples data that are reported by SDC. For example, of the 5,328 acquisitions of subsidiaries reported by SDC, the availability of sensible multiples data for both the unlisted target and comparable public acquisitions limits the number of observed average acquisition discounts to 607 (11% of the original sample). Given these data constraints, the generalizability of my results is a concern. One way to address this issue is to document how the sample with acquisition discount data differs from the full sample of acquisitions of unlisted targets reported by SDC.

Panel A of Table 5 presents the time-series of acquisitions of unlisted targets and the fraction of that sample with acquisition discount data. Reliable acquisition discount data does not appear in the SDC sample until 1985 (subsidiaries) or 1986 (stand-alone private firms), despite the fact that SDC initiates (scant) coverage of acquisitions of unlisted targets in 1979. While there is time-series variation in the fraction of the sample with acquisition discount data (for example, the largest fraction of acquisitions of stand-alone private firms with acquisition discount data is in the early 1990s), such data is not clustered in any one year or any one period. Acquisition discount data appears to be reasonably well spread out over time for both stand-alone private firms and subsidiaries, although the most marked decline in coverage is at the end of the time series (2002 – 2003).

Panel B documents the characteristics of two sub-samples of unlisted targets – those acquisitions for which I can measure the acquisition discount and those acquisitions for which I cannot. There are a couple of notable differences between the two sub-samples. Acquisitions of

unlisted targets for which I can measure the acquisition discount are significantly more likely to be successfully completed ex post – this facet of the data would be expected if bidders only announce the price paid for an acquisition if it is consummated. Bids with discount data are also significantly less likely to be all-cash offers. However, for acquisitions of subsidiaries the fraction of all-cash offers in the sub-sample with acquisition discount data is still almost 90% – while this is significantly lower than the 94% of subsidiary acquisitions without discount data that are all cash offers, it still indicates that the vast majority of offers in the sub-sample with measurable acquisition discounts are cash purchases of subsidiaries. As would be expected, subsidiaries with acquisition discount data are significantly larger than targeted subsidiaries without such data, consistent with a slight bias in the data collection methods of SDC (favoring large unlisted targets – although the same is not true for stand-alone targets). There are no other significant differences in Table 5 between the data-availability sub-samples.

Overall, the results in Table 5 are consistent with the contention that the approximately 12% of unlisted targets for which I do measure acquisition discounts are not substantially different from the remainder of the population of unlisted targets reported by SDC. There is very little time-clustering in the portion of the sample with available acquisition discount data, and the differences in characteristics between the data-availability sub-samples is not suggestive of any important biases in my results. There is almost no evidence in Table 5 that would suggest that my results are not reasonably robust and generalizable.

4. The relation between acquisition discounts and the need for, or availability of, liquidity

Section 3 demonstrates that discounts in acquisitions of unlisted targets are reasonably robust and average approximately 15 – 25% of the acquisition multiple for acquisitions of comparable publicly-traded firms (H1). The remainder of this paper is dedicated to explaining the cross-sectional variation in these acquisition discounts, with the intention of demonstrating that acquisition discounts vary with unlisted firms owners' need for liquidity and/or the availability of alternate sources of liquidity (H2a and H2b).

I first document that the sellers of unlisted firms are, on average, in need of the infusion of liquidity that comes from the sale. Table 6 presents summary statistics for abnormal accounting and stock-return metrics for parent firms for the year prior to subsidiary sales. The focus of the table is on parent firms divesting unlisted subsidiaries because documenting the need for liquidity by the owners of unlisted stand-alone firms would be extremely difficult due to data limitations. All accounting data for parent firms is from Compustat, and abnormal accounting performance is relative to the average metric for industry- and size-matched portfolios comprised

of all firms on Compustat in the year prior to the subsidiary acquisition in the same 2-digit SIC code and with total assets within 20% of those for the divesting parent firm.[19]

The average parent firm selling a subsidiary has significantly negative abnormal cash balance, cash flow, and net working capital (all scaled by assets), and significantly positive abnormal leverage (all are also true of the median). This implies that, on average, parent firms selling subsidiaries (typically in return for cash) have significantly less liquid assets and significantly more debt than the average firm of similar size in the same 2-digit SIC code. Table 6 also shows Z-scores (Altman, 1968), which are convenient combinations of a variety of accounting and stock-market information that give a snapshot of a firm's financial health. In the original Z-score formulation, firms with Z-scores less than 1.8 are extremely likely to enter bankruptcy in the near future, while those with Z-scores greater than 3 are unlikely to enter financial distress. As can be seen in Table 6, the average and median Z-score for parent firms selling subsidiaries is between these two extremes (2.25 at the median), indicating an uncertain future for these firms.

More importantly, however, the abnormal Z-scores (difference between parent-firm Z-score and the average in the industry- and size-matched portfolio) for parents selling subsidiaries are significantly negative on average, suggesting that these firms are in substantially worse financial condition than their peers. Furthermore, the average abnormal long-term debt rating is significantly positive – parent firms selling subsidiaries not only have abnormally low cash balances and cash flow, but also have lower credit ratings assigned by Standard & Poor's, indicating a lower capacity to borrow to make up for the cash shortfall. Compustat assigns numerical values to credit ratings that equate to 1 point per rating category (2 being AAA and 11 being BBB, the lowest investment grade categorization), so on average firms divesting subsidiaries have credit ratings that are almost a full rating category worse than similarly-sized firms in the same industry.

Subsidiary sales also follow 12 months of very poor stock returns at the parent level. Parent compound 12-month abnormal returns are the compounded monthly difference between parent returns and the CRSP value-weighted index for the 12 months ending the month prior to the sale announcement, and at the median parent firms selling subsidiaries suffer abnormal returns of -5% in the 12 months prior to the sale. Parent-firm compound abnormal returns in the

[19] Table 6 reports abnormal accounting and stock-return performance statistics using the full sample of subsidiary sales with Compustat or CRSP data. However, only a fraction (11%) of the subsidiary-sale sample has data that produces a sensible acquisition discount. Limiting the sample to only those observations with both acquisition discount data (Table 5) and the appropriate Compustat or CRSP data required to compute pre-sale performance metrics does not materially change the results in Table 6.

12 months prior to the acquisition announcement are significantly negative at both the mean and median. These cumulative stock returns are strongly supportive of the prior-year abnormal accounting measures in the remainder of the table, and consistent with the hypothesis that parents sell subsidiaries in order to ease financial constraints (Shleifer and Vishny's (1992) "fire sales").

While the vast majority of subsidiary sales are for cash, there are some (6%) that involve the swap of (at least some) bidder equity for the subsidiary. The most striking results in Table 6 emerge when the sample is stratified by method-of-payment. Characteristics associated with financial distress or constraints (significantly negative median abnormal cash-to-assets, cash-flow-to-assets, working-capital-to-assets, and Z-score, significantly positive median abnormal leverage, and significantly negative median compound abnormal returns) are only observed in the sub-sample of subsidiary sales where the bidder pays cash to acquire the subsidiary, and in almost all cases the median abnormal performance statistics are significantly different between the sub-samples based on method-of-payment in the direction that suggests that those parent-firms selling subsidiaries for cash are the most financially constrained in the sample. This evidence reinforces the notion that cash sales of subsidiaries are designed to ease a liquidity crisis or pay down abnormally high debt loads, and is also consistent with the findings in Lang, Poulsen, and Stulz (1995).

Having established that subsidiary sales are *on average* motivated by the need for liquidity, I now turn to the relation between the need for, or alternate sources of, liquidity and acquisition discounts (H2a and H2b). As described in the hypotheses section (2.2), owners with a greater need for liquidity, or facing liquidity constraints when alternate sources of liquidity (debt and equity markets) are unavailable or costly to access, will be in a weaker bargaining position relative to the proposed buyer of the corporation being sold and therefore be prepared to accept a lower acquisition price compared to the "fair" value of the assets (i.e., a more negative acquisition discount).

Table 7 presents univariate evidence on the difference in average acquisition discounts for sub-samples stratified by parent pre-sale 12-month compound abnormal returns, the method-of-payment in the proposed acquisition of the unlisted firm, and two proxies for the availability of alternate sources of liquidity. I use parent-firm pre-sale compounded 12-month abnormal returns as a proxy for parent-firms' *need* for liquidity. While any of the variables in Table 6 could conceivably be used as such a proxy, I have data on pre-sale stock returns for a greater proportion of parents selling subsidiaries than for any of the other variables listed in Table 6, and stock returns provide a convenient metric that is clearly consistent with the other liquidity parameters in Table 6 and has support in the literature as a metric for parent-firm pre-sale performance (Lang,

Poulsen, and Stulz, 1995). The method-of-payment in acquisitions of unlisted firms is introduced because cash provides more immediate liquidity than a stock-swap does. Therefore, if acquisition discounts for unlisted firms reflect the "price" of liquidity, acquisition discounts should be more negative when buyers pay cash to the owners of unlisted target firms than when they pay with bidder stock.

Following Harford (2005), I use the spread of commercial and industrial (C&I) loan rates (on loans greater than $1 million) over the federal funds rate as a proxy for the availability of liquidity in debt markets – the cost of obtaining liquidity via a bond issue or a bank loan should be increasing with this spread (all else equal).[20] Harford (2005) (and the references therein) use the C&I rate spread as a proxy for "aggregate liquidity," although in this paper this proxy is intended to specifically measure the cost of obtaining liquidity in debt markets. I also measure IPO volume and underpricing as metrics for the ease with which private owners of a stand-alone firm or corporate owners of a subsidiary could sell equity in the unlisted firm as an alternative to selling the whole firm to a willing buyer. IPO volume is measured as the number of IPOs per quarter scaled by the number of firms listed on CRSP (in thousands) at the beginning of the quarter (as in Lowry, 2003), and IPO underpricing is the quarterly average of the first day returns for all IPOs in a quarter. Each acquisition of an unlisted target is matched to the C&I loan spread, IPO volume, and average IPO underpricing in the quarter in which the acquisition announcement date falls, and I compare these metrics to time-series medians based on the full quarterly time series of C&I loan spreads, IPO volume, and average IPO underpricing.

The univariate statistics in Table 7 are strongly supportive of hypotheses H2a and H2b. Specifically, acquisition discounts for subsidiary targets are significantly more negative when the parent-firm's compound 12-month abnormal return is less than zero (-35%) than when the parent-firm's 12-month return is greater than zero (-22%). Parent firms experiencing below-market-average stock return performance over the year prior to the sale sell unlisted subsidiaries at approximately a 10 – 15% greater discount to the average multiple for comparable publicly-traded targets than "healthy" parent firms do.

One alternative to the "need for liquidity" explanation for this result (H2a) is that the subsidiary itself *causes* the parent's poor pre-sale performance, and as a poorly-performing business units attracts a lower sale multiple than publicly-traded targets in the same industry and of similar size. While it is difficult dismiss this explanation without detailed subsidiary operating performance data (which is not available for this sample), several facets of my data support the

[20] Some of this data is available on the Federal Reserve Board's website (http://www.federalreserve.gov/releases), and the remainder was generously provided by Jarrad Harford.

interpretation that poor parent-firm performance unrelated to the subsidiary in question causes a "fire sale" of the subsidiary. The subsidiaries being divested in this sample are generally small parts of the parent's overall business (4% of parent assets at the median), and therefore unlikely to be large enough in relative terms to *cause* parent-firm underperformance. However, the cash from subsidiary sales is large enough on average to generate much-needed liquidity for the parent-firm's potentially-beleaguered principal operations. Furthermore, in later tables I show that the relation between subsidiary sale discounts and parent pre-sale performance holds primarily in sales of *non-core* (or unrelated) subsidiaries, and I find it unlikely that on average a small, unrelated subsidiary could be responsible for poor performance at the firm-level for parents. While this is undoubtedly the case in some portion of the sample, the sample averages are much more likely to be driven by poorly-performing parent firms selling small and non-core subsidiaries at a discount ("fire sales") to generate liquidity for their primary operations (H2a).

Table 7 also shows that the method of payment in acquisitions of unlisted stand-alone firms affects acquisition discounts. For stand-alone unlisted firms, acquisition discounts average 15% when the buyer is paying cash to the owners, but are negligible when the buyer is exchanging stock in the larger firm for the equity in the unlisted target. Given that cash provides immediate liquidity while stock does not (especially if the former owners of the unlisted target become blockholders in the bidder), this result supports the contention that sellers of unlisted targets accept lower acquisition multiples in return for the provision of liquidity.

Access to alternate sources of capital also has a significant impact on acquisition discounts for unlisted targets. The average acquisition discount is -21% for subsidiaries when the commercial and industrial loan spread is below its time-series median (looser credit conditions), and -31% for subsidiaries when the loan spread is above its time-series median (tighter credit conditions). Low credit spreads make debt capital cheaper to access for parent-firms as an alternative source of liquidity, reducing the necessity to accept low sale multiples in return for the provision of liquidity. Furthermore, acquisition discounts for unlisted stand-alone firms are significantly more negative (-22%) when IPO volume around the time of the sale is below its time-series median compared to sales conducted in periods of high IPO volume (-9%). This result suggests that the owners of private firms accept lower sale multiples when equity markets are not receptive to IPOs, the obvious alternative source of liquidity. Both these debt- and equity-market results are strongly consistent with hypothesis H2b, indicating that sellers of unlisted assets accept lower sale prices when alternative sources of liquidity are more expensive, or difficult, to access.

Table 8 presents multivariate regression tests of the hypothesized relations between acquisition discounts and the need for, or availability of, liquidity (H2a and H2b). The regression results are reported separately for stand-alone and subsidiary unlisted targets as the univariate evidence suggests that different factors affect each of the sub-samples (for example, debt markets appear to affect sale prices for parents selling subsidiaries, while the state of equity markets seem to have a greater impact on sale prices for stand-alone firms).

The multivariate results in Table 8 are consistent with the univariate evidence in Table 7. For stand-alone private firms, acquisition discounts are significantly more negative (lower sale prices) when buyers pay cash in the acquisition, providing immediately liquidity to the trapped owners of non-traded shares. Acquisition discounts are also significantly positively associated with IPO volume, which again shows that the owners of stand-alone private firms sell out at greater discounts compared to multiples earned by publicly-traded targets in comparable acquisitions when aggregate IPO volume is low (i.e. an IPO is a less viable alternate source of liquidity).

I also find considerable support for both H2a and H2b in the sub-sample of subsidiary acquisitions. Acquisition discounts for subsidiaries relative to acquisitions of comparable public firms are significantly negatively associated with the C&I loan spread in all specifications in Table 8 – parent firms appear to sell subsidiaries at significantly lower prices relative to publicly-traded assets when debt capital (an alternate source of liquidity) is relatively more expensive to access. Acquisition discounts are also significantly positively related to parent-firm stock return performance in the year prior to the sale – acquisitions of subsidiaries are priced at significantly greater discounts to comparable public acquisitions when parent firms have lower 12-month compound abnormal stock returns (H2a). This result holds after controlling for the average 12-month compound abnormal return for firms in the same industry as the parent, but the coefficient on the parent's compound 12-month abnormal return is also significantly positive without such controls and is not greatly affected by the independent variables included in regressions such as those documented in Table 8.

Clearly, however, acquisition discounts for subsidiaries are most sensitive to prior parent-firm performance for sales of subsidiaries outside the parent's core line of business. While the interaction of parent stock return and the indicator variable for core subsidiaries (Parent in same industry as subsidiary) is not statistically significant, it is negative and almost of the same magnitude as the coefficient on parent-firm prior return performance in Table 8. This suggests that the most significant fire sales in this sample occur in sales of non-core parts of a parent's operations. These results are strongly consistent with H2a, as poor parent pre-sale performance

increases the need for liquidity, and appears to increase the price paid for accessing pools of liquidity by selling non-core subsidiaries for cash. These results also support the notion that financially constrained or poorly performing parents sell non-core subsidiaries at substantial discounts to raise cash to support their core line of business.

While the fire sales hypothesis (H2a) receives broad support in tables 7 and 8, Shleifer and Vishny (1992) offers more precise predictions than those tested in these tables. In particular, Shleifer and Vishny predict that the most depressed sale prices for assets will occur when the economic shock causing the parent-firm to be financially constrained (Table 6) is an industry-wide shock, in which case the pool of intra-industry buyers is made up of firms that are themselves financially constrained. In those circumstances, Shleifer and Vishny predict that firms will be more likely to sell to buyers outside the industry in question, and that buyers from outside the industry do not place the highest value on industry-specific assets, further depressing the sale price.

Table 9 shows average acquisition discounts for subsidiary sales conditioned on parent and rival pre-sale stock return performance and parent, bidder, and subsidiary industry affiliation. Panel A stratifies the data by whether the parent-firm's compound abnormal return for the 12 months leading up to the subsidiary sale is more negative than -5% or more positive than +5% (i.e. extreme losers and winners), and by whether the parent and subsidiary are in the same industry. The results in Panel A confirm those in Table 8, but help to give the results in Table 8 economic scale. The average acquisition discount for very poorly performing parents (pre-sale 12-month abnormal return < -5%) selling non-core subsidiaries (parent not in the same industry as subsidiary) is -38%, which is significantly different from, and almost twice the magnitude of, the average acquisition discount of -23% for parents with market-adjusted pre-sale returns of greater than 5% selling unrelated subsidiaries. In other words, poorly-performing parents sell non-core subsidiaries at almost twice the discount to comparable acquisitions of publicly-traded targets that well-performing parent-firms do. Interestingly, the cell with the greatest number of observations in Panel A is the interaction of poor parent-firm performance and the sale of a non-core subsidiary – not only is this the cell with the largest average acquisition discount, it is also the cell into which the most observations can be categorized. Panel A demonstrates that the mode subsidiary sale involves the sale of a non-core subsidiary following poor parent-firm performance, and that the interaction of these characteristics is associated with severe acquisition discounts relative to comparable publicly-traded targets.

Panel B conditions on poor parent-firm pre-sale return performance and the sale of core subsidiaries to test the prediction in Shleifer and Vishny (1992) that the most depressed sale

prices for assets will occur when the return shock causing the parent firm to be financially constrained is endemic to the industry, and that sale prices will be especially depressed when a buyer from outside the industry acquires the subsidiary. Panel B shows that there is no significant difference in average acquisition discount between intra- and inter-industry buyers when both the parent-firm and the average industry rival have market-adjusted 12-month compound abnormal returns more negative than -5% (i.e. are experiencing a common negative shock). The direction of the difference in average acquisition discounts is, however, consistent with the prediction in Shleifer and Vishny (1992) – when parents sell subsidiaries outside the core industry they accept discounts of 33% relative to acquisition multiples for comparable publicly-traded targets. These discounts are substantially larger than the 13% average discounts in deals involving intra-industry bidders in the presence of a common industry shock, although the small sample sizes limit the statistical power of the estimates.

The most striking results in Panel B of Table 9 are found, however, where the parent-firm experiences what appears to be an idiosyncratic negative shock. When parent-firms have substantially negative pre-sale return performance but the average rival has above-market return performance over the same period, the average acquisition discount is substantial (approximately -60%) regardless of the industry affiliation of the buyer. This is, however, the situation in which it is most likely that the acquisition discount represents poor performance at the core subsidiary itself rather than a price discount *caused* by parent-firm liquidity needs (H2a), because parent and subsidiary are in the same industry and experiencing significantly worse stock-return performance than the average rival in that industry.

5. Conclusions and implications

In this paper I document discounts for acquisitions of unlisted targets that average approximately 15 – 25% relative to multiples paid to acquire comparable publicly-traded firms. I find consistent evidence that parent-firms are liquidity-constrained prior to the sale of unlisted subsidiaries, and that the extent of these liquidity constraints is significantly associated with acquisition discounts – consistent with the hypotheses offered here, acquisitions of unlisted subsidiaries are priced at greater discounts to comparable publicly-traded targets when the parent firm has poorer pre-sale performance (i.e. is in greater need of liquidity). Furthermore, I find strong support for the contention that acquisition discounts are related to aggregate debt- and equity-market liquidity – acquisition discounts for unlisted targets are significantly more negative when aggregate liquidity is tight and hence liquidity from the sale of non-traded assets more valuable. My results broadly support the notion that acquisition prices for unlisted targets are sensitive to the liquidity needs of

the owners of non-traded firms and reflect a lack of bargaining power caused by either greater liquidity needs or tighter aggregate debt- and equity-market liquidity conditions.

Acquisition discounts for unlisted targets appear to be the price paid by their owners for access to an important source of liquidity. While recent research has concluded that the listing-status of the target firm significantly affects the returns to bidders (Fuller, Netter, and Stegemoller, 2002; Moeller, Schlingemann, and Stulz, 2004; and Faccio, McConnell, and Stolin, 2004), little attention has been paid to the prices or premiums in acquisitions of unlisted firms. This paper remedies that omission, and finds an important link between results in the M&A and divestitures literatures. Selling a part, or the whole, of a firm is an important source of liquidity for the trapped owners of equity in non-traded assets – but a source that comes with a price that appears to at least equal that of alternate sources of liquidity (public and private debt and equity markets). However, the results in this paper imply that selling part of an unlisted firm is a last-resort source of liquidity for owners that need sources of cash when the alternatives are unappealing or unavailable. As such, the price paid to access liquidity by selling unlisted assets is reflected in the discounted sale price and, potentially, in the returns accruing to the buyers of unlisted firms.

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Table 1

Sample statistics

This table contains averages and medians (in parentheses) for a sample of successful and unsuccessful acquisition bids for more than 50% of the equity of both publicly-traded and unlisted targets from the SDC Mergers and Acquisitions database for 1979 – 2003. Bids are included in the sample if the bid has a deal value of more than $50m and the method-of-payment is all-cash, all-stock, or a mix of cash and stock. Total assets are reported by SDC for all targets and by Compustat for parent firms for the year prior to the acquisition attempt. Pre-bid market value of equity is measured using data from CRSP 50 days prior to bid announcement. Subsidiary percent of parent assets is the ratio of subsidiary assets (from SDC) to parent assets (from Compustat). Cash from subsidiary sale as % of parent-firm cash balance (truncated) is the ratio of the cash paid to acquire the subsidiary to the parent-firm's cash balance from Compustat for the year prior to the acquisition attempt, with observations less than 0% and greater than 500% discarded from the sample. Parent abnormal announcement returns are the cumulative difference between parent stock returns and the CRSP value-weighted index over the three-trading-day window centered on bid announcement. Successful is a dummy variable equal to one if the bid is ultimately consummated, and zero otherwise. Cash is a dummy variable equal to one if the bid is all-cash, and zero otherwise. Post-bid competition is a dummy variable equal to one if SDC records another bid for the same target by a different bidder in the six months following bid announcement, and zero otherwise. The numbers in square brackets are the numbers of observations in each sub-sample. [a] indicates that the mean or median in the Stand-alone or Subsidiary unlisted target category is significantly different from the mean or median in the Publicly-traded target category at the 1% level using a two-sided *t* or Wilcoxon test.

	Publicly-traded targets	Unlisted targets	
		Stand-alone	Subsidiary
Target total assets ($m)	2,007.61 (292.55) [4,206]	262.16 [a] (52.50) [a] [417]	1,173.39 (255.15) [a] [416]
Parent total assets ($m)			29,736.54 (5,468.12) [2,938]
Parent pre-bid market value of equity ($m)			12,090.22 (2,221.80) [3,144]
Subsidiary percent of parent assets (%)			13.15% (3.99%) [220]
Cash from subsidiary sale as % of parent-firm cash balance (truncated)			104.94% (49.10%) [2,129]
Parent abnormal announcement return (-1,+1)			1.92% (0.64%) [3,149]
Successful (0/1)	0.77 [4,559]	0.95 [a] [2,829]	0.93 [a] [5,328]
Cash (0/1)	0.53 [4,559]	0.60 [a] [2,829]	0.94 [a] [5,328]
Post-bid competition (0/1)	0.08 [4,559]	0.01 [a] [2,829]	0.02 [a] [5,328]

Table 2

Raw acquisition multiple data from SDC

Price to book value of equity, Price to earnings per share, Deal value to EBITDA, and Deal value to sales are acquisition multiples reported by SDC. In all cases the numerator is a measure of the price offered by the acquirer for the target's equity (i.e. excluding assumed liabilities) and the denominator is an accounting measure from the year prior to the acquisition attempt. The top number is the sub-sample average, the number in parentheses is the sub-sample median, and the number in square brackets in the number of observations in the sub-sample. [a], [b], [c] indicates that the mean or median in the Stand-alone or Subsidiary unlisted target category is significantly different from the mean or median in the Publicly-traded target category at the 1%, 5%, or 10% level (respectively), using a two-sided *t* or Wilcoxon test.

	Publicly-traded targets	Unlisted targets	
		Stand-alone	Subsidiary
Price to book value of equity	5.48 (2.36) [4,046]	774.54 [a] (5.98) [a] [273]	40.84 [a] (2.19) [292]
Price to earnings per share	51.28 (21.40) [3,219]	90.88 [c] (20.30) [249]	176.22 [a] (18.30) [a] [283]
Deal value to EBITDA	27.44 (9.94) [3,233]	272.46 [a] (10.75) [a] [205]	123.87 [a] (9.26) [195]
Deal value to sales	6.44 (1.58) [4,196]	309.97 [a] (1.85) [a] [619]	15.38 [b] (1.05) [a] [1,036]

Table 3

Estimates of bid premiums

This table contains means and medians (in parentheses) of estimates of bid premiums for the sample of acquisition attempts for publicly-traded and unlisted targets over the 1979 – 2003 period. The premium estimates are based on the excess of an acquisition multiple (price to book equity, price to earnings, deal value to EBITDA, or deal value to sales) over the average market valuation multiple (market to book, price to earnings, market value to EBITDA, or market value to sales, respectively) for industry- and size-matched portfolios of comparable firms. The portfolio of comparable firms for each target is all firms on Compustat with the same 2-digit SIC code as the target and with total assets within 20% of total assets reported by SDC for the target in the year prior to the acquisition attempt. Because of outliers in the acquisition multiple data, the premium estimates are truncated: estimates smaller than -0.5 and larger than 1 are discarded from the sample. The Average multiples-based premium is the equally-weighted average of the premiums for each target firm computed using the four separate multiples reported by SDC. The numbers in square brackets are the numbers of observations in each sub-sample. ***, **, * indicates that the mean or median is significantly different from zero at the 1%, 5%, or 10% level (respectively), using a two-sided *t* or Wilcoxon test. ^{a}, ^{b}, ^{c} indicates that the mean or median in the Stand-alone or Subsidiary unlisted target category is significantly different from the mean or median in the Publicly-traded target category at the 1%, 5%, or 10% level (respectively), using a two-sided *t* or Wilcoxon test.

	Target is:		
	Publicly-traded	Unlisted	
Premium metric:		Stand-alone	Subsidiary
Excess price to book value of equity	0.1609*** (0.1302)*** [2,694]	0.3023$^{***\,a}$ (0.3012)$^{***\,a}$ [91]	0.0405^{a} (-0.0271)^{a} [140]
Excess price to earnings per share	0.1378*** (0.0908)*** [2,094]	0.0945** (0.0475)** [119]	0.0979** (0.0350)** [101]
Excess deal value to EBITDA	0.1865*** (0.1474)*** [1,811]	0.1125$^{**\,c}$ (0.0759)$^{*\,c}$ [97]	0.0484^{a} (-0.0804)^{a} [97]
Excess deal value to sales	0.1421*** (0.0969)*** [2,268]	0.1661*** (0.1313)*** [126]	0.0819** (-0.0929)$^{**\,c}$ [128]
Average multiples-based premium	0.1484*** (0.1340)*** [3,581]	0.1786*** (0.1509)*** [233]	0.0819$^{***\,a}$ (0.0314)$^{***\,a}$ [235]

Table 4

Estimates of acquisition discounts for unlisted targets

This table contains means and medians (in parentheses) of estimates of acquisition discounts for the sample of acquisition attempts for unlisted targets over the 1979 – 2003 period. An acquisition discount is the percent difference between the acquisition multiple (price-to-book equity, price to earnings, deal value to EBITDA, or deal value to sales) for an unlisted firm and the average multiple for industry- and size-matched comparable acquisitions of publicly-traded targets. The portfolio of comparable acquisitions for each unlisted target is all acquisitions of publicly-traded targets in the same 2-digit SIC code as the unlisted target with deal value excluding assumed liabilities (from SDC) within 20% of deal value excluding assumed liabilities for the unlisted target and occurring within 3 years prior to the acquisition of the unlisted target. Because of outliers in acquisition multiple data, the acquisition discount estimates are truncated: estimates larger than 1 are discarded from the sample (to be symmetric with the implicit lower bound of -1). The Average acquisition discount is the equally-weighted average of the acquisition discounts for each target firm computed using the four separate multiples reported by SDC. The numbers in square brackets are the numbers of observations in each sub-sample. ***, **, * indicates that the mean or median is significantly different from zero at the 1%, 5%, or 10% level (respectively), using a two-sided *t* or Wilcoxon test.

	Unlisted targets	
Premium metric:	Stand-alone	Subsidiary
Excess price to book value of equity	0.0843* (0.0738)* [98]	-0.1969*** (-0.3385)*** [142]
Excess price to earnings per share	-0.2768*** (-0.3158)*** [142]	-0.2899*** (-0.3975)*** [127]
Excess deal value to EBITDA	-0.1641*** (-0.1759)*** [117]	-0.2272*** (-0.2821)*** [102]
Excess deal value to sales	-0.1297*** (-0.1867)*** [302]	-0.2812*** (-0.4152)*** [553]
Average acquisition discount	-0.1562*** (-0.2065)*** [353]	-0.2598*** (-0.3405)*** [607]

Table 5

How representative is the sample of acquisition discounts?

This table presents the time-series distribution of acquisitions of unlisted targets (Panel A) and the medians (or means for indicator variables) of various characteristics for acquisitions of unlisted targets (Panel B), both conditioned on the availability of acquisition discount data (Table 4). Year is the bid announcement year and Parent publicly listed is an indicator variable equal to one when a subsidiary's parent-firm can be matched from SDC to the CRSP database, and zero otherwise. Deal value (excluding assumed liabilities) is reported by SDC. In Panel B, the numbers in square brackets are the numbers of observations in each sub-sample, and ***, **, * indicates that median (or mean) is significantly different between the two data-availability-based sub-samples at the 1%, 5%, or 10% level (respectively) using a two-sided Wilcoxon (or *t*) test.

Panel A: Distribution by year

	Stand-alone unlisted targets		Subsidiary unlisted targets	
Year	Number of transactions	% with acquisition discount data	Number of transactions	% with acquisition discount data
1979	1	0.00%	1	0.00%
1980	1	0.00%	2	0.00%
1981	2	0.00%	1	0.00%
1983	1	0.00%	0	0.00%
1982	0	0.00%	0	0.00%
1984	5	0.00%	33	0.00%
1985	32	0.00%	140	7.14%
1986	85	17.65%	231	8.66%
1987	58	8.62%	210	14.29%
1988	83	14.46%	301	14.62%
1989	81	8.64%	258	20.16%
1990	41	21.95%	198	14.14%
1991	42	26.19%	140	17.14%
1992	56	33.93%	154	12.34%
1993	84	20.24%	192	14.58%
1994	98	26.53%	245	11.43%
1995	109	16.51%	279	6.09%
1996	219	10.96%	314	6.69%
1997	293	10.24%	413	15.01%
1998	335	11.34%	473	8.88%
1999	333	11.11%	434	13.13%
2000	374	10.43%	385	12.99%
2001	159	10.69%	269	11.15%
2002	155	8.39%	303	8.91%
2003	182	8.79%	352	5.11%
Total	2,829	12.48%	5,328	11.39%

Panel B: Medians (or means for indicator variables) of sample characteristics conditioned on data availability

	Stand-alone unlisted targets		Subsidiary unlisted targets	
	w/ acquisition discount data	w/o acquisition discount data	w/ acquisition discount data	w/o acquisition discount data
Successful	0.97 [353]	0.95* [2,476]	0.95 [607]	0.93** [4,721]
Cash	0.47 [353]	0.61*** [2,476]	0.89 [607]	0.94*** [4,721]
Deal value (excluding assumed liabilities) ($m)	103.81 [353]	103.00 [2,474]	150.00 [607]	140.00** [4,721]
Parent pre-bid market value of equity ($m)			2,330.51 [376]	2,217.79 [2,768]
Parent publicly-listed			0.62 [607]	0.59 [4,721]
Subsidiary percent of parent assets (%)			4.51% [107]	2.96% [113]
Cash from subsidiary sale as % of parent-firm cash balance (truncated)			53.37% [240]	48.52% [1,889]

Table 6

Liquidity of subsidiary parents prior to subsidiary sales

This table contains average and median (in parentheses) differences between parent-firm accounting-based liquidity measures and the average corresponding measure for all firms on Compustat in the same industry (2-digit SIC code) as the parent-firm and with total assets within 20% of that for the parent-firm in the year prior to the acquisition attempt, and for parent-firm compound 12-month abnormal returns. Cash is the cash balance, cash flow is earnings before depreciation but after interest, taxes, and dividends, and net working capital is current assets minus current liabilities, and all are scaled by total assets. Leverage is the book value of long-term debt divided by the sum of the book value of long-term debt and the market value of equity. Altman's Z-score is defined in Altman (1968). All accounting data (including the long-term debt rating) are from Compustat from the year prior to the acquisition. Parent compound 12-month abnormal return is the compounded difference between parent firm monthly returns and CRSP value-weighted index return over the 12 months prior to, but not including, the bid announcement month. The numbers in square brackets are the numbers of observations in each sub-sample. ***, **, * indicates that the mean or median is significantly different from zero at the 1%, 5%, or 10% level (respectively), using a two-sided *t* or Wilcoxon test. ^{a}, ^{b}, ^{c} indicates that the mean or median in the Non-cash or mixed method-of-payment category is significantly different from the mean or median in the Cash method-of-payment category at the 1%, 5%, or 10% level (respectively), using a two-sided *t* or Wilcoxon test.

	Full sample	Method-of-payment	
		Cash	Non-cash or mixed
Abnormal cash / assets	-0.0137*** (-0.0161)*** [2,440]	-0.0150*** (-0.0164)*** [2,295]	0.0072 ^{b} (-0.0109) [145]
Abnormal cash flow / assets	-0.0239*** (-0.0060)*** [2,206]	-0.0247*** (-0.0066)*** [2,075]	-0.0111 (0.0015) ^{b} [131]
Abnormal net working capital / assets	-0.0364*** (-0.0151)*** [1,868]	-0.0385*** (-0.0160)*** [1,757]	-0.0040 ^{c} (0.0081) [111]
Abnormal leverage	0.0416*** (0.0133)*** [2,369]	0.0466*** (0.0178)*** [2,232]	-0.0403** ^{a} (-0.0567)*** ^{a} [137]
Altman's Z-score	2.6148*** (2.2489)*** [2,167]	2.5427*** (2.2045)*** [2,038]	3.7538*** ^{a} (2.9114)*** ^{a} [129]
Abnormal Altman's Z-score	-0.5744*** (-0.4444)*** [1,780]	-0.6189*** (-0.4497)*** [1,677]	0.1509 ^{c} (-0.2047) ^{c} [103]
Abnormal long-term debt rating	0.7926*** (0.5000)*** [1,643]	0.8048*** (0.5000)*** [1,562]	0.5564* (0.3000) [81]
Compound 12-month abnormal return	-0.0315*** (-0.0542)*** [3,039]	-0.0390*** (-0.0546)*** [2,861]	0.0894 ^{a} (-0.0479) [178]

Table 7

Acquisition discounts, the need for liquidity, and the availability of alternate sources of liquidity

The table presents average acquisition discounts for stand-alone and subsidiary unlisted targets for various sub-samples based on parent-firm pre-sale stock-return performance, method-of-payment, and debt- and equity-market characteristics. C&I loan spread is the spread of the interest rate on commercial and industrial loans greater than $1m over the intended federal funds rate in the quarter of the acquisition attempt. The time-series median C&I loan spread is based on the quarterly time series of spreads between 1985 and 2003. IPO volume is measured as the number of IPOs in the quarter of the acquisition per thousand firms listed on CRSP at the beginning of the quarter, and IPO underpricing is the average first-day stock return for IPOs in the quarter of the acquisition. IPO data is from Jay Ritter's website (http://bear.cba.ufl.edu/ritter/ipodata.htm), and the time-series median of volume and underpricing is based on the quarterly time series from 1979 to 2004. The numbers in square brackets are the numbers of observations in each sub-sample. ***, **, * indicates that the average acquisition discount is significantly different between the paired sub-samples at the 1%, 5%, or 10% level (respectively), using a two-sided test.

	Unlisted targets	
	Stand-alone	Subsidiary
Parent pre-sale stock returns		
Compound 12-month abnormal return > 0		-0.2197 [150]
Compound 12-month abnormal return < 0		-0.3461** [214]
Method-of-payment		
Cash	-0.1499 [158]	-0.2642 [538]
Mixed or all-stock	0.0045*** [168]	-0.2250 [69]
Debt-markets		
C&I loan spread > time-series median	-0.1675 [177]	-0.3119 [307]
C&I loan spread <= time-series median	-0.1448 [176]	-0.2064*** [300]
Equity-markets		
IPO volume > time-series median	-0.0910 [176]	-0.2322 [263]
IPO volume <= time-series median	-0.2209*** [177]	-0.2809 [344]
IPO underpricing > time-series median	-0.1862 [207]	-0.2422 [325]
IPO underpricing <= time-series median	-0.1135 [146]	-0.2801 [282]

Table 8

The determinants of acquisition discounts

The table contains the results of OLS regressions with the average acquisition discount per acquisition attempt for an unlisted target (Table 4) as the dependent variable. Bidder in same industry as target is an indicator variable equal to one if the bidder and the subsidiary or stand-alone private target are in the same 2-digit SIC code, and zero otherwise. Parent in same industry as subsidiary is an indicator variable equal to one if the parent-firm and the subsidiary being sold are in the same 2-digit SIC code, and zero otherwise. Rival compound 12-month abnormal return is the average compounded difference between firm return and CRSP value-weighted index return for all firms in the same industry (2-digit SIC code) as the parent firm. All other independent variables are defined in prior tables. White-corrected heteroskedasticity-consistent standard errors are in parentheses. ***, **, * indicates that the regression coefficient is significantly different from zero at the 1%, 5%, or 10% level (respectively).

	Stand-alone unlisted targets		Subsidiary targets		
Intercept	-0.3937	-0.2929	0.1783	0.1920	0.3270
	(0.2954)	(0.2819)	(0.2231)	(0.2284)	(0.2817)
C&I loan spread	0.0518	0.0393	-0.2755**	-0.2783**	-0.3764**
	(0.1530)	(0.1458)	(0.1191)	(0.1182)	(0.1520)
IPO volume	0.0105**	0.0084*	-0.0012	-0.0014	-0.0028
	(0.0051)	(0.0048)	(0.0036)	(0.0036)	(0.0044)
Cash		-0.1541***		-0.0375	
		(0.0509)		(0.0608)	
Bidder in same industry as target		0.0412		0.0584	
		(0.0499)		(0.0405)	
Parent in same industry as subsidiary				-0.0079	
				(0.0419)	
Parent compound 12-month abnormal return					0.2376***
					(0.0803)
Parent compound 12-month abnormal return * Parent in same industry as subsidiary					-0.1926
					(0.1233)
Rival compound 12-month abnormal return					-0.1125
					(0.1252)
Adjusted R^2	0.02	0.04	0.01	0.01	0.04
Number of observations	353	353	607	605	364

Table 9

Acquisition discounts, parent-firm stock returns, and industry-rival stock returns

This table presents average acquisition discounts for various sub-samples of subsidiary sales. All conditioning variables are described in prior tables. In Panel B, the sample is constrained to sales of subsidiaries in the same industry (2-digit SIC code) as the parent firm occurring following poor prior parent firm stock-return performance (cumulative abnormal 12-month returns < -5%). [a], [b], [c] indicates statistically significant differences between averages in columns (same row) and [***], [**], [*] indicates statistically significant differences between averages in rows (same column), at the 1%, 5%, or 10% level (respectively).

Panel A: Interaction of Parent and subsidiary industry affiliation and parent returns prior to sale

	Parent compound 12-month abnormal return	
	< -5%	> +5%
Parent in same industry as subsidiary	-0.3128 [76]	-0.2734 [45]
Parent *not* in same industry as subsidiary	-0.3814 [113]	-0.2260 [b] [82]

Panel B: Interaction of Bidder and subsidiary industry affiliation and industry average returns prior to sale, conditional on Parent compound 12-month abnormal return < -5% and Parent in same industry as subsidiary

	Rival compound 12-month abnormal return	
	< -5%	> +5%
Bidder in same industry as subsidiary	-0.1261 [26]	-0.5896 [c] [5]
Bidder *not* in same industry as subsidiary	-0.3337 [19]	-0.6394 [c] [11]